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A LECTURE ON STAINED GLASS

BY

PROFESSOR R. ANNING BELL
R.A., R.W.S.



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A LECTURE ON STAINED GLASS, DELIVERED IN THE ROYAL COLLEGE OF ART STUDENTS' COMMON ROOM, BY PROFESSOR R. ANNING BELL, R.A., R.W.S., ON TUESDAY, 31ST JANUARY, 1922.



Y subject of Stained Glass is a very wide, vague, large sort of subject, and of course it is quite impossible to talk about it in any thorough way in the course of an evening. You want to write books about it. I thought it would be interesting to you, perhaps, to talk about the more recent variations and changes, the evolution in the use of glass. The fact that this modification in Stained Glass is very largely the work of artists trained in this College should interest you particularly.

Stained Glass, commonly so-called—it is a misnomer, for it is really coloured and painted glass—is one of the three great Christian decorative arts: Mosaic, Stained Glass, Fresco. They are in sequence, roughly speaking, but they overlap. First, Mosaic in the earlier ten centuries. It began about the 4th century and went on to the Renaissance, when its character changed. You then get Stained Glass, overlapping it about the 12th century; and the third great Christian art is Fresco Painting, which flourished from the 14th century onward, following a long and slow development from a very early period.

These three seem to be the main arts through which the expression of the Christian religious scheme, its story, and its emotion have been conveyed—Sculpture has found expression in all religions. They have a considerable sympathy in the fact that they all demand plain surfaces, flat or curved, and are all closely associated with architecture. Each of them also has been so important, so dominating, that it has affected the architectural treatment of the buildings which it was designed to adorn.

Coloured and painted glass is the outstanding decorative treatment of the Gothic period—the age of the cathedrals. The earliest stained glass which we know is, I believe, of the 10th or 11th century, and there are but few examples existing now. The great period runs from about 1200 to 1550 or so in its full vigour. That is

the big cycle of stained glass; it went on living after that, and is reviving, I am glad to say, nowadays; but those centuries showed its highest and fullest development. It was then that the conditions of life and architecture allowed its completest opportunity of expression. After that it was adapted—with a much simpler treatment, with far less colour, with more painting on clear glass—to domestic decorative work, and you will see a good deal of Continental work of a very pleasant and attractive type of the 16th and 17th centuries.

The practical function of stained glass is comparable with that of mosaic. Mosaic is an enrichment of the shadow. Buildings designed for mosaic usually have quite small windows, low down in the big domes or sparsely set in the side walls, and it is the mosaic enrichment of shadow, vaguely lit by reflected light from these windows, which gives it its highest beauty. The peculiar charm of mosaic depends largely on the gold treatment of the background, which is infinitely more attractive when seen on curved surfaces and lit from below.

Stained glass is a method of glorifying and modifying the light which enters a building; it has a wide range, from a limpid clarity to rich and even sombre depths. Its power of emotional suggestion is considerable and this, doubtless, commended it to the mediaeval mystics.

The spiritual function of stained glass is, like that of mosaic, by a noble beauty of treatment, to present elevated ethical and religious ideas in a worthy way. It may do this by means of symbolism, or by typifying virtues and moral qualities by individual figures of great characters from mythology or from religious history. For symbolism and these type-figures it is peculiarly suited. Further, its function is to enhance and to deepen the mood of religious exaltation which the architecture of the building has already suggested to the worshipper. Stained glass is essentially a method of strengthening, carrying further and enriching the mood in which the worshipper finds himself when he enters those noble buildings, so full of the sense of aspiration and exaltation, and of the mystery which lies behind the outward show of things. That is just by way of showing you the sort of attitude which, I believe, we should adopt towards stained glass. You must realise that your work is more than making pleasant and agreeable colour and striking a casual note of beauty. You have more than that to carry out, and deeper feelings to express.

Now to come down to the material, to what is called stained glass. The fact is it is merely coloured glass. It is glass melted and mixed up in the pot with various coloured oxides, green, blue or red, whatever you want. Then the blow-pipe is put in, and with a quantity of the sticky mixture attached to it is then blown out into a large bulb, just as ordinary window glass is, and cut off and flattened out on big tables to cool. The beauty of the quality of stained glass is very largely owing to the irregularity of the thickness of it, and you often get subtle variations in the colour, streaks, blotches of colour and so on; the thickness of the glass makes quite an appreciable difference in the depth of the colour, as you can easily imagine. One selects from the large sheet of glass the particular piece which contains a tone of colour one wishes to use.

Another treatment of glass is very largely used. This is called "flash" glass. It was found that if the glass were coloured right through with vigorous blues, ruby reds, and greens, it became so deep that you did not get enough light through it. So quite early they found out a method by which a film of colour could be applied to a sheet of clear glass, usually of a greenish tinge. You have the same thickness of glass as in the other method, but the colour is in a thin stratum on the surface of it. This "flash" glass has another advantage which we occasionally make use of; you can work away the thin veneer of colour, leaving only the clear glass, an obvious method for making patterns. It used to be done by means of a wheel with which you ground away the surface rather laboriously, now you stop out with Brunswick Black the parts you do not want to eliminate and apply acid—it is the same method as in etching—and when you get down to the clear glass you get rid of the acid. Then you can paint in your brown paint or yellow stain, and you get quite an attractive effect. You will often see it done in rich robes and in crowns and things like that; it is quite useful and workmanlike, but if it is used too much it becomes tricky and pretty.

Now for the practice of the craft. I am afraid this will be very commonplace talk to those students who are working at stained glass, but possibly some others will be interested. I particularly hope the more advanced painter students may be interested, for it is to them one rather looks to take to stained glass in the last years of their education when they have become fairly competent in drawing and design, that is the time when stained glass should become to them a very attractive and fruitful means

of expression. The modern practice is extremely like the old practice. The craft has the great attraction to my mind of being one of those crafts which have changed very little all through the ages, and the workshop method of executing stained glass now is very much what it was in the earliest days.

The tools are very much the same, too, except that for cutting the glass nowadays we use the more convenient modern diamond. The old method was simple but rather laborious. When you wanted to cut out a piece of glass you got a rather stoutish iron wire which you made red hot, and you drew the iron wire over the lines you wanted to break, and then with another tool you just nipped it off all round. They did the most extraordinarily elaborate things in those days with these. I think they got towards the later period to be far too fond of showing off their skill. They cut most preposterous, irregular and odd shapes to show they could do them; it was a case of the skilful craftsman getting a bit beyond himself.

After the glass cutting comes the painting. This is done in the same way as it always was, and the leading too. There are several sizes of leads, $\frac{1}{2}$ in., $\frac{3}{8}$ in., and $\frac{1}{4}$ in., etc. It is just a piece of narrow lead flanged in the middle to separate the adjacent pieces of glass, and when the lead is fixed all round the pieces, cement is put in to hold it together. You want to be a good plumber to do it very well, as I think our students have found out. I think all who practise the art should go through the workshop and learn to cut the glass and to lead it up; it is not a very serious part of their training; it is not necessary that they should become expert plumbers, but they should learn how and why it is done. I should very much like to have an expert plumber and an expert glazier to do that part of the work for the more advanced students, so that they could get on more quickly with advanced work. But I am afraid we shall not have that just yet, owing to the need for economy all round.

Now getting further on, I take it the earlier people designed their windows in a much more simple way than we do. They had no cartoons, I think. I believe that they set the work out on the long wooden bench on which the glass is laid to be leaded up and cut, and marked it out with charcoal. Very often they had to use up bits of glass they had got, and make the designs fit into these, as glass was very expensive. Again, the early work is generally based on geometrical forms. A tall window would be cut up into seven or eight diamonds, circles, quatrefoils, or such like; with ornamen-

tal detail in between. That gives an opportunity of using up very small pieces of glass. In those days labour was not very valuable and glass was, and so they did not like to waste any bits. Nowadays you cut a large sheet of glass, you get a few bits out of it, and often that is about all you can use of it. They had very few colours, and as you could not go very far wrong with a limited palette, I really think very much of the beauty of the earliest glass is because they could not help themselves. The earlier glass was glaziers' work, it was the men thinking of leading it up rather than of the painter's work, who made the design.

Then about 1300 somebody discovered that extraordinarily effective and useful material, the yellow stain. It was found that a solution of silver painted on the glass would give, according to its strength and according to the firing, all sorts of shades of yellow. This led them to escape from the coarse note in stained glass. Blues, reds and greens are very good as a rule, but the neutral colours are rather poor, the purples are not very good, and yellow is inclined to be coarse. The yellow stain was of great assistance, and they could get nearly all the yellows they wanted; it was very much more manageable because they could shade it off.

The next thing is the paint, which is just a sort of brown monochrome. It is a colour which has an affinity with glass, which, when fired, fuses into the glass and becomes part of it. There are what are called enamel colours, that is to say they are enamels painted on and fired over the glass in the same way that the brown paint is fired on, and they give, of course, variations of colour necessary in heraldry, etc. This method is rather to be distrusted, because it can only be used safely in small quantities; it is inclined to fly and disappear in large spaces.

We have now dealt with the main materials: the glass, the leads, the stain and the paint, and I think I have said all that is necessary about the materials themselves. Once you know your materials, the production of a stained glass window is essentially and properly a piece of communal work. I do not a bit sympathise with those people who say they do the whole thing themselves. Why should a man who is capable of designing a thing well be a plumber and glazier; he ought not to. It is like the people who insist on building their own houses, the sort of people who wear sandals and live on nuts. Besides it is so unsocial; it is so much better that it should be a communal art. I like to think that the man who cuts the glass and the rest have some kind of

interest in doing the work; they are not merely your slaves to do a cut-and-dried job, merely arbitrarily. I like to talk it over with the men, from whom, too, you often get quite useful suggestions. My own training has been entirely that way. I learned stained glass backwards, really. I began by designing windows, and then learned how to work them—designing them all wrong, and talking to the fellows in the shop and learning about it that way. I had the ordinary training of a painter, I thought a stained glass window was the kind of thing you just did with charcoals and “genius.” I see now quite constantly in a workshop in Scotland my first stained glass efforts; they are a very valuable lesson in modesty—they are quite absurd. They turned out well enough because the fellows in the workshop knew their job; they did it, and talked to me, and I had the sense to see they knew the work better than I did, and we got the work out pretty well in the end. You people here with a useful craft shop, with all the materials to hand, have a tremendous advantage over us older people who just had to find out the best way we could. It was years and years before I really got to do it in a workmanlike way, and I am still finding out all sorts of faults.

First of all, of course, you get a commission; that is quite a difficult thing to do. The subject is next settled; that also is often a very difficult thing, particularly if you have a Committee. Then you make a design and, having got the design approved, you get the templates, and set the thing out on the cartoon. When you have to ask for templates, see that you get them made of cardboard or of paper, otherwise the local builder will send you an enormous construction of wood, which is very unmanageable, costs a lot in travel, and is very awkward for setting out. A piece of old wallpaper or brown paper will do well for templates, carefully marked as to their relative places in the window and particularly with the “inside” well marked as well as cut out to the shapes. Often all you need is the head of the window above the “springing” and figures showing what length it is below. You cannot trust the masonry if it is not modern, and not always then; old work is almost always irregular. There is a decorative window over there (pointing), those lights are extremely irregular, and we had to have a template of every bit of it; one light is about $1\frac{1}{2}$ in. wider at the bottom than the top. They sent the templates carefully measured up, and I set up the cartoons. It seemed all right, the window was made and sent down and put up. When I

got to see it in the church, I found the windows were not horizontal at the bottom, the middle one was 1 in. lower than this one, and the other one 1 in. lower than that again. The result was these saddle bars, which are quite straight on the cartoons, made three steps in the window. It is really rather disconcerting to see the saddle bars running across slightly out of the true, it catches the eye of a person used to making stained glass. I was very angry with myself when I saw it on the opening day. You must be quite sure that the shapes of the window are accurately produced, and you must not trust your template of the top of one light to do for the others; you want one for each. Even in recent work, however good the mason is, there is quite often some slight variation.

Having got your templates, you now get them traced out on the cartoon, which has to be done very carefully. Having set out the shape of the window, you place the saddle bars across. The function of these saddle bars is to hold the window up; without them the weight of glass in a long window would bulge it out or drag it down. These bars are usually about 1 in. wide, and the window is tied to them by means of copper wires. An advantage of that is that if the window has to be taken out, you only have to take out a piece at a time, just untwist the wires and take each piece between the bars away separately. If you forget to mark in the saddle bars on the cartoon, you may find when you come later to settle their positions that they cross a face or other important part of your design.

After you have got your cartoon set out, you start making your drawing, and there are a number of cartoons here which show the varying treatments different people use. The usual method is to draw them in charcoal, and leave the colour to be taken from the small sketch. You will see some very admirable sketches here by Martin Travers, one of our old students. One can fairly trust to these to do the main colour of the window. They are so close to the design in detail, that the sketch is quite enough to make the glass from without colouring the cartoon. I find myself rather less decided than that, and I am so inclined to vary the design on the cartoons, that I have to colour them just to make sure I am not losing the proportion or the distribution of colour. If you are able to stick close to your sketch, you do not need to colour the cartoon; if you are a person who varies, it is best to colour the cartoon. There is also this to be said. One is very much inclined, in doing elaborate charcoal drawings, to put in a great deal too much detail and

not to trust the glass enough; glass itself is such a charming material that often the less detail on it in paint, the better the effect.

When you have done your cartoon, it goes into the workshop, and is laid down on a large bench, a stretch of tracing linen is placed over it, and the middle line of each of the leads is traced. That line is drawn so as to be as thick as the central flange in the lead. It is to separate the two pieces of glass. You have now a map of the window. Then all these shapes are numbered, and they are either cut out or another tracing is made and is cut out and numbered again; the coloured glass, which has already been chosen, is then laid over the paper shapes of the separate pieces, and is cut out and also numbered, all your pieces of glass are numbered and correspond to the numbers on the tracing, so that their places may be readily found.

Before this you must have chosen the glass. If you are not the head of a workshop, the most practical method is to go through and choose with the foreman, who is often a very intelligent man. You choose the main colours, you choose your two or three principal reds and two or three principal blues and greens, and as they naturally carry through the window, they keep the key right. Then you have to leave it to him to choose the minor tints, the various variations in these shades of "white." There are a great many variations; you want an expert man to choose those, you cannot do it yourself unless you own the workshop and spend your life in it, because you do not know the stock. If you do own the shop and spend your life at it, you find in a short time you have got the business to get, you have got to keep your men employed, pay your rent and wages; you spend most of your time in getting the work, and the rest of your time doing the cartoons; and you have not got time to look into the details of choosing the glass. It is not a practical thing. Nobody who is essentially a stained glass man can do the whole work himself, he has got to trust to other men; it is necessarily a piece of communal work. The men work better if they have an interest in it. Of course, though, you supervise the whole and alter any piece you don't like.

You have the glass chosen, the main tints, and they are then cut out, and the shapes all being settled by means of the bits of paper I spoke of, then they are fixed as you see here on a large sheet of plain glass, fixed in the positions they are in on the cartoon; all the separate pieces of glass for as large a portion as it is convenient to paint at one time. Then you put it up against the

light, and you paint them from your cartoon, or they are painted by a competent man. That is the beginning of the final stage. After they are painted once, they are fired, and generally painted a second time, and sometimes they are done a third time, with a sort of turpentine paint—they call it “tar.” Each time it is fired the paint fades a little: the second painting is largely needed to strengthen what is fired away in the first. One is supposed to know what is to happen in the firing, but sometimes unfortunate accidents happen.

After it is all painted the leads are put round these pieces, they are cemented together, and that is the window finished for fixing.

Now a word about the modern tendencies in stained glass, and I am very glad to say this is illustrated very largely by old students of this school. I speak of modern tendencies as compared with those of thirty or forty years ago, modern works since the Gothic revival—such as the work done by artists of standing and distinction, the works of Rossetti, Madox Brown, Burne-Jones, William Morris, and others—I think the principal alteration has been very much in the use of leading. That sounds, perhaps, unimportant and vague to those who have not been working in stained glass, but it is really of the first importance. The leading, theoretically, and almost always in mediaeval people, was simply done to separate one figure or one colour from another, to separate the head from the clothing, and the armour from the surcoat, and such things as that. You had the lead lines drawn as far as possible simply round the form, you would have lead lines round every separate colour, but, if you could help it, you tried not to have any lead lines across. You tried to arrange it so that you could have a plain piece of colour with lead lines round it, and no interfering bars across. Modern work has broken away from that very much, I think myself to the advantage of the art of stained glass. The use of lead lines not only to emphasise form but for structural reasons and to emphasise important parts of the design, to give quality to the colour, and also to give opportunities of variation of the colour, is one modern tendency.

It was largely suggested to modern men by the fact that old glass as you see it now is so much broken up by cross lines, because it broke accidentally and has been mended. They were so clever that they often cut round dangerous shapes which did not last, and had to be leaded across to hold the window together. These proved to be so attractive in enriching the window that the sug-

gestion was taken up, and it has now become a vicious mannerism, in fact I have heard of a man who had a stained glass window deliberately broken up, and just leaded up the cracks. But you may do it when you feel that it helps your design, if it emphasises interesting points, or enriches the colour.

Another tendency of modern glass is the tendency to the use of silhouette against plain silvery glass. It is going back to the later middle ages, when they were fond of this treatment. The silhouette treatment has various qualities, various advantages; it emphasises and, I think, makes necessary a rather symbolic treatment of stained glass, and as I think the symbolic is the more distinguished, the more noble use of the material, this treatment has a strong appeal.

Another tendency in the work of contemporary designers which I regret is the absence of bordering. They are so inclined to treat figures and quarries right up to the mullion or wall without any border. It is severe and simple, but you lose the advantage in colour very often. This is a point for those of you who are attempting to treat modern subjects in stained glass, because modern subjects are very difficult. We have not the advantage our luckier ancestors had of seeing people all round us wearing rich and strong colours, colours akin to those of glass, and also fine textures; black broadcloth is not like the black velvet worn by gentlemen in the old days. You must find your colours somewhere else if you want to use modern figures, and you must manage somehow by means of borders or the decorative crosspieces which divide the window. So I would suggest that you should pay as much attention to the use of borders as you possibly can. You can have a very good, rather silvery picture without much colouring, such as modern subjects would probably demand, and yet get your colour by having a rather rich and wide border. Modern figures look best in quite small areas usually.

Another tendency, not very important, but very helpful to colour, is that in the last thirty years the light glass has been used much whiter and clearer. When I began to do stained glass the correct thing was a kind of dull green, rather a sage green, a "greenery, yallery" kind of thing. I think it was because the dullish green stuff was thought to give a less new or modern effect. As you probably know, very little glass is white, it nearly all has some tint, but contrasting strong colour knocks it out, and makes you think it is clear. There are a few sorts of glass of a really clear,

limpid quality, but you cannot use them too much; they are far too dazzling.

Another tendency is, I think, to use more primary colours; strong colours are used more and not so many secondary shades: that is because the strong colours, the real colours, red and blue and green, the sober and the sombre, the deep and rich colours, are the most effective contrast with this very silvery white. When you get into half tones of browns and greys, you get rather a dull effect. The work done by good men thirty or forty years ago is often of that character. If you go to Christchurch Cathedral, Oxford, there are several windows by Burne-Jones and Morris, quite good ones, but they look rather washed out, except the earliest one which, on the contrary, is very vivid. It is partly because the glass itself is not as deep and strong as it might be, and partly because there is not enough lead, the pieces are rather too big, and partly, perhaps, because there is some very good old glass to be seen near by.

Another tendency which is a good one is the increased reliance upon painting in line, the increasing avoidance of that flat, mat affair, which has been the workshop tradition up till recently. Like many modern workshop traditions it is simply one of incompetence and mental idleness, it means they did not know how to do it better, and you could also employ cheaper labour, because you do not want the same type of educated man to do it.

There is now a school of young artists who are doing very good work, and I hope we shall soon have more—both men and women. Like pottery painting, it must not be timid, you have got to do it with a decided, firm, steady stroke, it does not do to be feeble, any more than it does on pottery; it is the vigorous, quick line you want: vigour is even more important than academic accuracy. But of course a good man can do it correctly.

There is also considerably more restraint in the amount of pattern on costume, borders, etc., and therefore more reliance on the quality of the glass itself. Those elaborate and ingenious patterns so general in, at any rate, the greater number of late nineteenth-century windows are found to be tedious and worrying; their object was, as a rule, to enrich a rather poor quality of glass. Nevertheless well-designed pattern work is very useful when judiciously used.

Now a few words to students who propose to take up the study of stained glass. First of all get thoroughly used to the material

and practise painting it, leaving the design of less important detail until the glass is being handled. The constant danger to the designer is the cartoon. I find that new students are far too apt to make elaborate cartoons before they are sufficiently familiar with the glass itself, and to cover them with details of ornament of a character which will not really help the result.

Stained glass is severe and at the same time rich. As with every technique the subject must be inseparable from the treatment. The *artist's* subject that is. This is not the same as that which the spectator regards as the "subject," and it is not the "art for art's sake" subject. It is not beauty divorced from meaning, except in the simpler forms of lead lighting or patterns in colour. These are often useful, often wanted, but they do not demand the highest imaginative qualities which our art can express. I have little sympathy with the desire to reduce our arts to the abstract. It is too austere and too puritanical an ideal. They are the better, I think, where the work is conceived in a moment of fervent exaltation. It may be religious, it may come from poetry, from music, from the external beauty of Nature; it may come as the wind comes, one knows not whence, but it sets a flame, as it were, to the imaginative mind, and in that flame the *artistic* subject is born.

Now without a real grasp of the craft this moment is wasted. Nothing is welded. The beautiful possibility cannot come to the birth, it is without form, it has no bodily shape, and is but one of those pitiful unrealised and unrealisable glimpses through the veil which form the tragedy of the incomplete artist.

Only when you are so familiar and so easy with your means of expression that their limitations, their so-called restraints, are to you a help and a happy freedom and as natural to you as the organs of your body, can you hope to realise the gift which is offered to you and transform it into your own artistic expression.

This does not imply that "to carry out the carrying out" will necessarily be easy, any more than it is always easy to make your body obey your wishes; but it will be natural, and the transformation will be unconscious, just as a school-boy is transformed into a cricketer quite unconsciously, but yet cricket is not easy.

To get down to facts, what all this means is that you must work at your technique until you never dream of wanting stained glass to do the things which stained glass won't do.

Now stained glass is at its best, as I have said, a severe and yet rich form of decoration. It can, in its lighter uses, express a sort

of quaintness or whimsicality, it can tell the gothic fairy tale—goblins, elves, gnomes, it can express a somewhat grimmish form of fantasy. I remember seeing a capital piece of work—quite small—giving the characters of that strange old Cornish song “Widdicombe Fair,” a rather macabre story—with the Ghost of the Old Grey Mare, Peter Hawke and the rest of the rout. But it cannot easily be gay and it can never be frivolous. How depressing is restaurant stained glass! I am speaking of stained glass, *i.e.*, coloured glass. White glass, painted, can convey a certain sedate cheerfulness, as one may see in 16th and 17th century domestic work; and when enamelled, as in the Swiss work, it even has a sort of sprightliness, of a Teutonic rather than of a Latin type. Excursions along these paths might give very interesting results to those whose temperaments lead them to such adventures. They have been by no means explored—and some of our students are gifted that way.

We modern people stand at a disadvantage compared to our ancestors in that the surroundings of our lives are not so immediately suggestive of treatment in glass as those which they enjoyed. Think of the luck of that man in Richard II's time who had to put “le Dispencers” round the choir at Tewkesbury. Not, of course, a great imaginative subject, but a very pleasant, interesting, and easy job—gorgeous knights in surcoats with their arms emblazoned. And then think of being asked to do a modern Cabinet Council! Nevertheless there are suggestions to be got from modern life, and I am glad to see that our students are aware of it—children, women—men are more difficult. Texture as well as colour is a difficulty, it cannot quite be ignored.

But the great, the profound difficulty is the absence of symbolic figures, of characters which have been “canonised” in our times by popular acclaim, and symbolism must be widely and readily recognised to be of value. Think of all the great moral qualities—and these are naturally the motives of much stained glass. Is it leadership in war? It is not General Haig, nor even Foch, your mind flies to—but Joshua or David, or Godfrey de Bouillon. Is it statesmanship? It is not Lloyd George or Gladstone, or even William Pitt—but rather Moses or Gregory, Hildebrand or Anselm. Is it patriotism and self sacrifice? Well, there are many graves “which are for ever England,” and yet—it is Joan of Arc we think of. Probably, Florence Nightingale and General Gordon are the only characters which have been “can-

onised" in recent times. And even in the case of Gordon does the present generation feel about him as we older ones did, who watched his tragedy and cherish his memory? If it comes to other than moral virtues, to figures typifying factors in the structure of Society—Law, Kingship, Commerce, Labour? Law would scarcely be a Lord Chancellor (or Justinian), but again Moses, with the Tablets given him from The Mount. Kingship would hardly be a modern sovereign—but Barbarossa as in the Spanish Chapel, or Charlemagne, or our own King Arthur.

Commerce is, I confess, a difficulty. I think possibly the gracious figure of Venice would be best. Certainly not the Port of London Authority or Sir Alfred Mond or Lord Leverhulme! For Labour, not that gorilla-like figure, with a huge jaw and no back to its head, brandishing a pick or a hammer, so favoured by the advanced politicians, and some sculptors, of to-day. But rather—the shepherds following the angel to the lowly manger.

It follows then, that those who wish to excel in stained glass designings should have a wide culture and real imagination, a sound knowledge of the necessary technique, and a thorough delight in the craft. I feel sure, too, that they would be all the better for study and design in other methods of artistic expression in order to avoid that staleness and repetition which too often comes to those who practice one form of art alone.

ROBERT ANNING BELL.

Lead glass is Brilliant white (up to 33% Lead)
Yellow of the topaz is got by 1% Ferric oxide or

by 4% antimonious oxide together with a tiny
 proportion 0.1% of Purple of Cassius

Brilliant blue = add small Quantity Cobalt oxide

Cobalt can in proper proportions give a Green

many metallic oxides give various colours without
 the glass losing its Transparency: The intensity
 of colour depending on the amount used

Ferrous oxide seems to pass into the condition of
 magnetic oxide & produces pale to ~~deep~~
 deep Green

Sesquioxide of manganese = Violet Tint

Black oxide of manganese in minute quantity can
 remedy a green stain produced by iron

Chromic oxide = Emerald Green

A mixture of oxides of cobalt & manganese gives
 a black glass

Cupric oxide (CuO) produces a green

Cuprous oxide (Cu_2O) do deep Red (intense Ruby)

Uranic oxide = Peculiar Opalescent Yellow

Yellow can also be got by oxides of silver & antimony

A compound of gold with oxide of Tin (Purple of Cassius)

Gives a magnificent Ruby glass

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